



**Operations Monitoring Report
Second Quarter FY10**

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I. Executive Summary

A review of the fiscal year 2010 (FY10) Second Quarter performance and contract obligations between Constellation Energy Projects and Services (CEPS) and the Metropolitan Government of Nashville and Davidson County (Metro) is presented in this report by Thermal Engineering Group, Inc (TEG). The status of the available funds for all active capital construction and repair and improvement projects are also presented. For the fiscal year 2010, CEPS has satisfactorily met all of the contract obligations to Metro and has had no contract violations.

For the Second Quarter FY10, the chilled water sendout decreased by approximately 1% over the previous Second Quarter (FY09), and the sales decreased by approximately 5%. The number of cooling degree days decreased by approximately 96% over the same periods. The peak chilled water demand for the current quarter is 13,400 tons with a cooling load factor for the quarter of approximately 35%. Chilled water sales have continued to decline each quarter since the First Quarter FY08.

The steam sendout is approximately 7.9% lower this quarter than the previous Second Quarter. Steam sales have decreased approximately 10% over the previous Second Quarter even though the quarter saw a 6.5% increase in heating degree days. Steam system losses were approximately 13% of the sendout which was approximately 21% higher than in the previous Second Quarter. The peak steam demand for the current quarter is 100,125 pounds per hour, which represents an approximate 10% decrease from the previous Second Quarter. The heating load factor for the quarter is approximately 47%. Steam sales have experienced a general decline over the past twelve months.

The Energy Generating Facility (EGF) performance continues to surpass the System Performance Guarantee (Guaranteed Maximum Quantity or GMQ) levels. The chilled water and steam plant electric consumptions continue to perform considerably lower than the guaranteed levels. The steam plant fuel efficiency decreased marginally from the previous Second Quarter. The total water consumption for the steam and chilled water plants has decreased approximately 8% from the previous Second Quarter. The chilled water EDS make-up has increased by approximately 44% with decreases in all other water uses.

Work continued on DES Capital and Repair & Improvement Projects during the Second Quarter of FY10. One project was closed during the Second Quarter FY10, DES051, the replacement of a condensate expansion joint in the 4th Avenue Tunnel. Design work was completed, and bids were received on two additional capital projects, DES062 and DES063. DES062 was awarded and construction began during the Second Quarter FY10 with completion anticipated in the Third Quarter FY10. The bids for DES063 were higher than expected, thus this project is being re-evaluated to determine methods to reduce its construction cost. In addition, the design for DES067, the EDS Tunnel Rock Rehabilitation, was substantially completed during the Second Quarter FY10. Bidding and award of this project is expected to take place during the Third Quarter FY10. Repair and Improvements to the EDS continue as scheduled.

The current fiscal year system operating costs were \$8,585,124 at the end of the Second Quarter. This value represents approximately 41% of the total budgeted operating cost for FY10. The customer revenues from the sales of steam and chilled water for the first half of FY10 were \$7,405,726 which is approximately 40% of the budgeted amount. The difference between the operating costs and customer revenue, the Metro funding amount (MFA), is \$1,179,398. This value is approximately 48% of budget.

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II. Energy Distribution System Sales and Performance

This section of the report discusses and presents performance information regarding the operation of the EGF for the periods described. Charts and tabular data are also presented to provide a more detailed description of the actual EGF performance.

A. Chilled Water

1. Sales and Sendout

A comparison for the Second Quarter chilled water sales is shown in Figure 1. This data reflects a decrease in sales for the current quarter over the same quarter of the previous fiscal year, and the number of cooling degree days decreased by approximately 96% this quarter. The Second Quarter FY10 was markedly colder than in previous years.

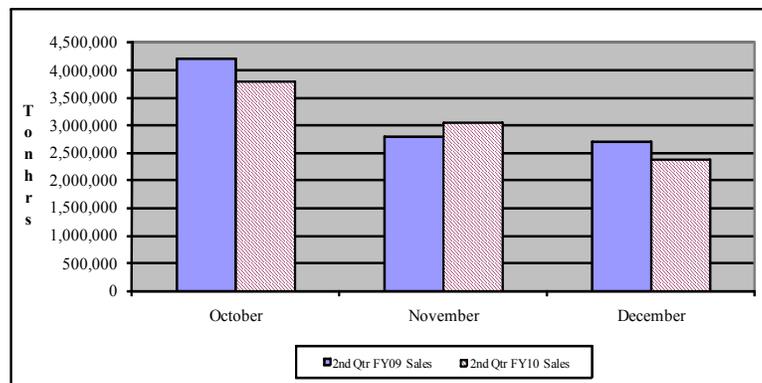


Figure 1. Second Quarter FY10 Chilled Water Sales Comparison

The peak chilled water demand for the current quarter is 13,400 tons. The cooling load factor for the current quarter, relative to sendout, is approximately 35% and is 9% less than in the previous Second Quarter.

Figure 2 shows the chilled water sales, sendout and losses for the previous twelve months. The losses on this figure are defined as the difference in tonhrs per month between the recorded sendout and sales values and represent the total energy loss for chilled water in the EDS. The number of cooling degree days per month are also tracked for comparison.

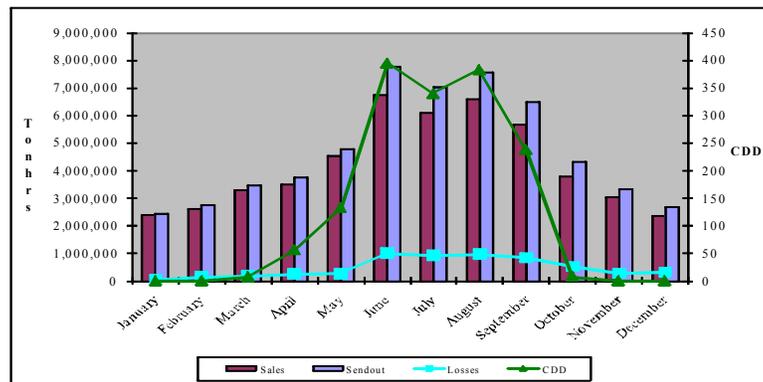


Figure 2. Chilled Water Sales, Sendout, Losses and CDD for the Previous Twelve Months

2. Losses

A comparison of the total, chilled water energy losses in the EDS for the Second Quarter is shown in Figure 3. These losses are the difference in chilled water sendout and sales. The energy loss is caused by a combination of the loss in the mass of chilled water and a net heat gain into the chilled water piping. The increase in supply temperature between the EGF and the customers is typically less than 1°F.

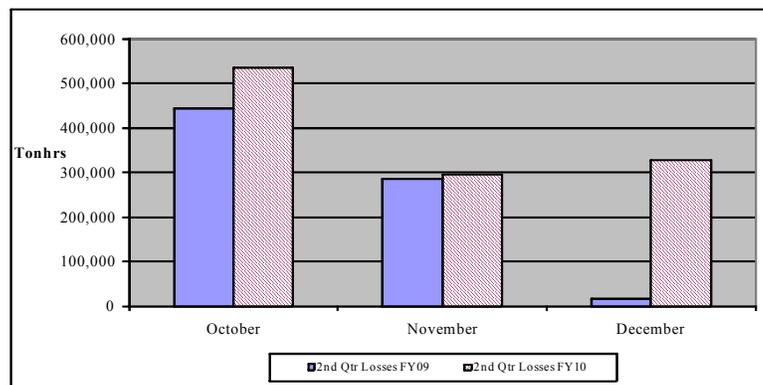


Figure 3. Chilled Water System Loss Comparison for the Second Quarter FY10

The EDS make-up increased by approximately 44% over the previous Second Quarter. The total energy losses also increased by approximately 55%. The make-up to the cooling towers decreased by approximately 10%. The number of cycles of concentration in the condensing water circuit increased in the Second Quarter by approximately 7% over the previous Second Quarter indicative of an improvement in water chemistry. The overall city water make-up comparison for the chilled water system is shown in Figure 4.

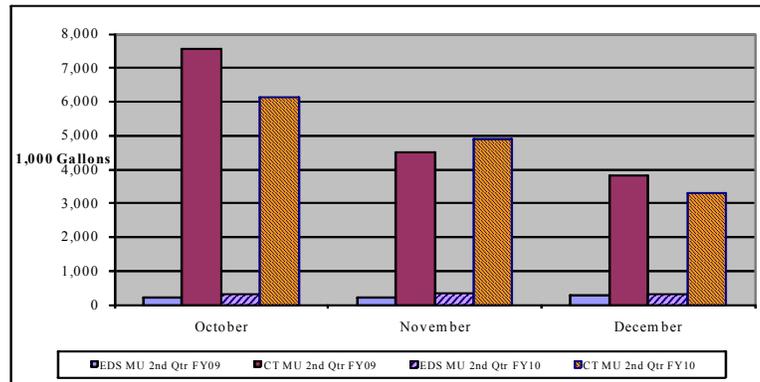


Figure 4. Chilled Water System City Water Usage Comparison

3. Performance

The performance of the chilled water aspect of the EGF is presented by the following two charts, Figures 5 and 6, for FY09-10. Under the management of CEPS, the System Performance Guarantee levels as described in the ARMA are being achieved quite satisfactorily.

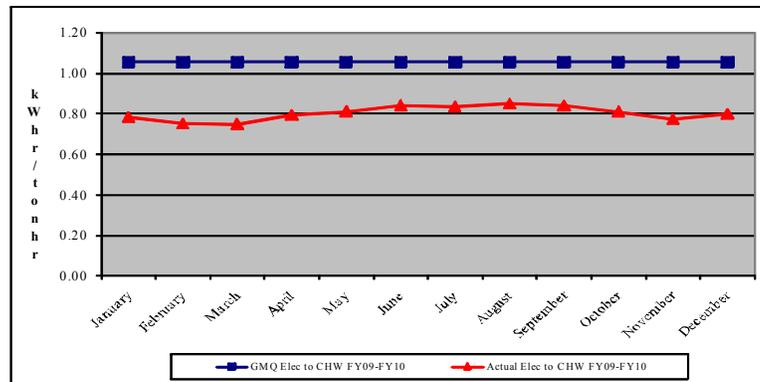


Figure 5. Chiller Plant Electric Performance Guarantee Comparison for the Previous Twelve Months

The chilled water allocation of the electric consumption falls under the GMQ limit of 1.055 kWhr per tonhr for the current quarter, and no excursion is reported for the current fiscal year. The electric usage for the current quarter decreased marginally over the Second Quarter for FY09. The actual chilled water plant water conversion factor is approximately 2.7% less than in the previous Second Quarter. The total consumption of city water for the chiller plant for the current quarter is approximately 8% less than that for the previous Second Quarter.

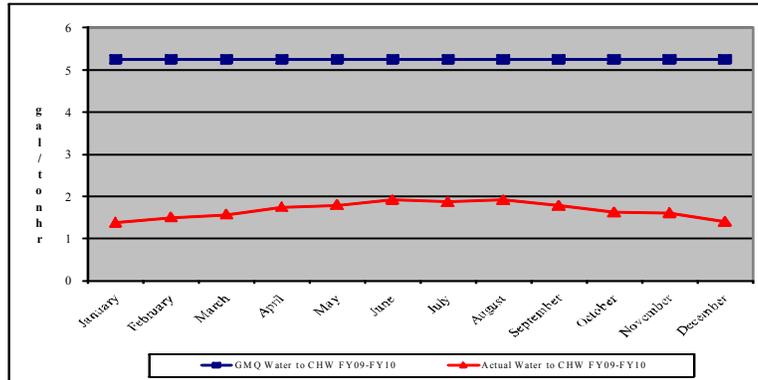


Figure 6. Chiller Plant Water Consumption Performance Guarantee Comparison for the Previous Twelve Months

B. Steam

1. Sales and Sendout

The steam sendout decreased by approximately 7.8% over the previous Second Quarter (FY09), and the sales decreased by approximately 10%. The steam system losses increased by approximately 11%. The number of heating degree days increased by approximately 6.5% over the previous Second Quarter. A comparison for the Second Quarter steam sales is shown in Figure 7.

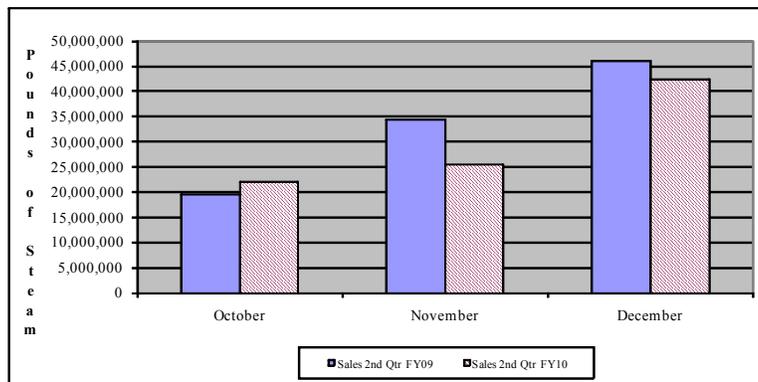


Figure 7. Steam Sales Comparison for the Second Quarter FY10

Figure 8 shows the steam sales, sendout and losses for the previous twelve months. The losses on this figure are defined as the difference in pounds per month between the recorded sendout and sales values and represent the total mass loss in the EDS between the EGF and the customer meters.

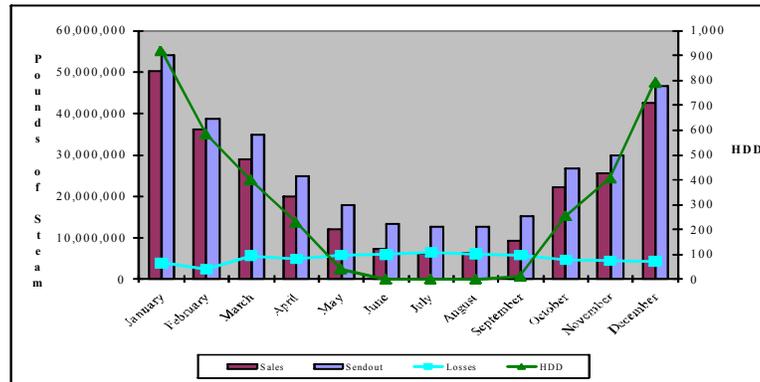


Figure 8. Steam Sales, Sendout, Losses and HDD for the Previous Twelve Months

The peak steam demand for the current quarter is 100,125 pounds per hour, which is approximately 10% lower than the peak demand for the previous Second Quarter. The heating load factor for the current quarter, relative to sendout, is approximately 47% and represents an increase in the load factor over the previous Second Quarter of approximately 2%.

2. Losses

A comparison of the total steam mass losses in the EDS for the Second Quarter is shown in Figure 9. The mass loss is caused by the heat loss in the EDS between the EGF and the customer meters, resulting in a mass loss at steam traps. Faulty traps, steam leaks or meter error could also be a contributing cause of these losses. The total losses for the current quarter are approximately 11% more than in FY09.

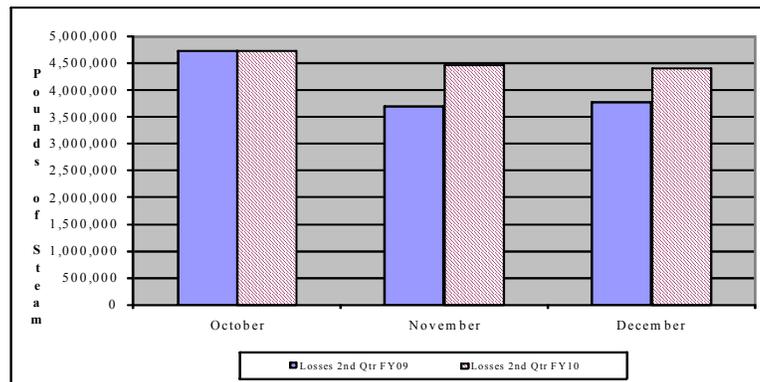


Figure 9. Second Quarter FY10 Steam System Losses

The amount of city water make-up (MU) to the steam system consists of the loss in mass between the EGF and the customers, in the condensate return from the customers to the EGF and losses at the EGF. This data is shown in the comparison of Second Quarter data in Figure 10. Figure 10 depicts a decrease in city water make-up to the steam system of approximately 9% for the current quarter.

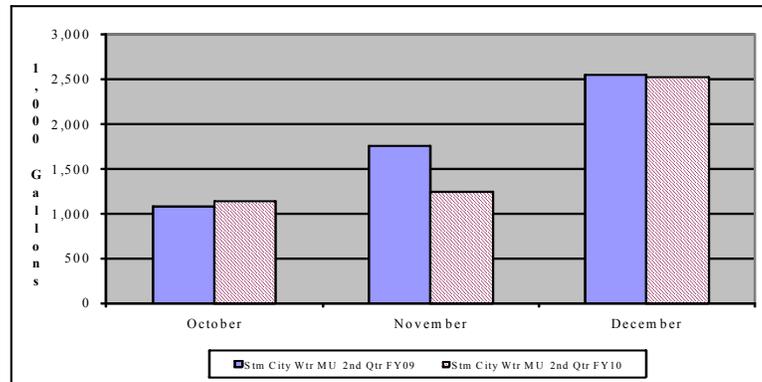


Figure 10. Second Quarter FY10 Steam System City Water Make-up Comparison

3. Performance

The performance of the steam system aspect of the EGF is presented by the following three charts, Figures 11, 12 and 13. Under the management of CEPS, the System Performance Guarantee levels as described in the ARMA are being achieved satisfactorily except for the occasional excursion in the electric consumption during the summer months.

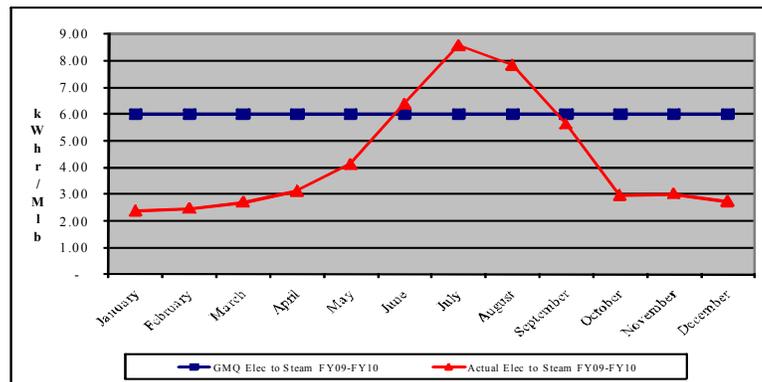


Figure 11. Steam Plant Electric Consumption Performance Guarantee Comparison for the Previous Twelve Months

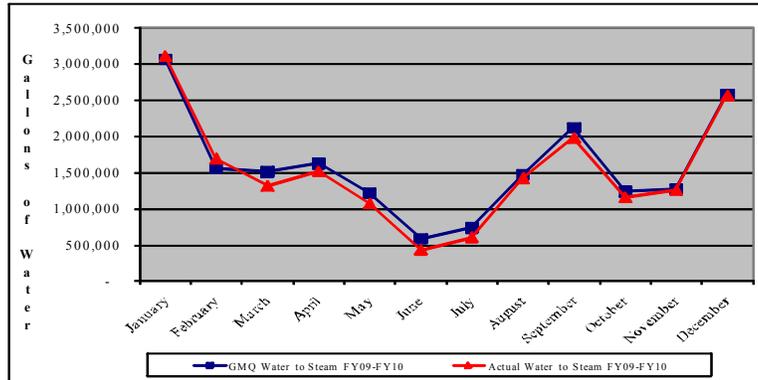


Figure 12. Steam Plant Water Consumption Performance Guarantee for the Previous Twelve Months

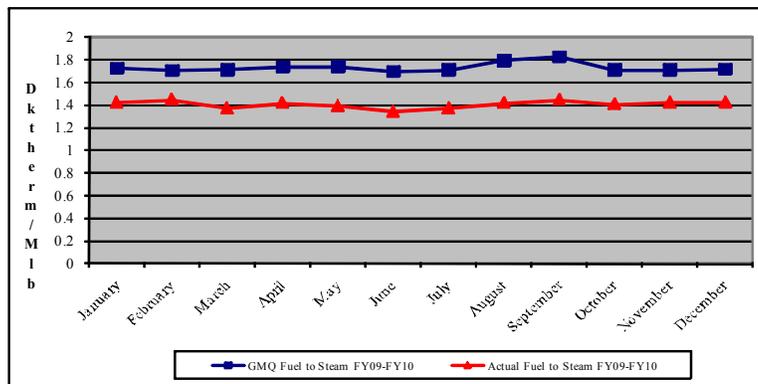


Figure 13. Steam Plant Fuel Consumption Performance Guarantee for the Previous Twelve Months

C. Contract Guarantee Performance

The production and sales performance for the EGF and EDS are summarized in Table 1 for the current quarter. Additional parameters, such as cooling tower blowdown and peak demands are listed in this table, as well. Table 2 presents the Second Quarter comparison of the Guaranteed Maximum Quantities (GMQ) of the criteria commodities (fuel, water and electricity).

Table 1. Second Quarter FY10 Production, Sales and Consumption Summary

Item	Unit	Second Quarter FY10	Second Quarter FY09	*Percent Difference
	days	92	92	0.00%
Total Electric Use	kW hrs	7,575,405	8,025,171	-5.60%
Chilled Water	kW hrs	7,317,642	7,748,815	-5.56%
Steam	kW hrs	257,763	276,356	-6.73%
Total Water Use	kgal	20,205	21,995	-8.14%
Total Chilled Water	kgal	15,289	16,592	-7.85%
EDS Make-up	kgal	968	673	43.83%
Cooling Towers	kgal	14,321	15,919	-10.04%
Calc CT Evaporation	kgal	12,069	13,264	-9.01%
CT Blowdown	kgal	2,252	2,655	-15.18%
Calc # Cycles		5.36	5.00	7.27%
Steam	kgal	4,916	5,403	-9.01%
Total Fuel Use	mmBTU	146,929	158,483	-7.29%
Natural Gas	mmBTU	146,871	158,451	-7.31%
Propane	mmBTU	58	32	N/A
Condensate Return	kgal	8,279	9,031	-8.33%
	lbs	67,521,467	73,653,850	-8.33%
Avg Temp	°F	162.7	160.3	1.46%
Sendout				
Chilled Water	tonhrs	10,373,000	10,477,100	-0.99%
Steam	lbs	103,397,000	112,207,000	-7.85%
Peak CHW Demand	tons	13,400	12,300	8.94%
Peak Steam Demand	lb/hr	100,125	110,813	-9.65%
CHW LF		35.06%	38.58%	-9.12%
Steam LF		46.77%	45.86%	1.98%
Sales				
Chilled Water	tonhrs	9,215,099	9,731,973	-5.31%
Steam	lbs	90,109,832	100,009,945	-9.90%
Losses				
Chilled Water	tonhrs	1,157,901	745,127	55.40%
Steam	lbs	13,557,168	12,197,055	11.15%
		13.11%	10.87%	20.62%
Degree Days				
CDD		8	203	-96.06%
HDD		1,450	1,361	6.54%

*positive percent difference values imply an increase from FY09 to FY10

Table 2. Second Quarter FY10 Performance Guarantee Comparison for Steam and Chilled Water

GMQ Calculations	Unit	Second Quarter FY10	Second Quarter FY09	*Percent Difference
Steam				
GMQ Elec Conversion	kWhr/Mlb	6.00	6.00	
Electric Conversion	kWhr/Mlb	2.86	2.76	3.52%
GMQ Plant Efficiency	Dth/Mlb	1.714	1.716	
Plant Efficiency	Dth/Mlb	1.421	1.412	0.61%
Actual %CR		65.30%	65.64%	-0.51%
Avg CR Temp	°F	163	160	1.46%
GMQ Water Conversion	gal	5,058,561	5,436,113	
Water Conversion	gal	4,965,160	5,457,030	-9.01%
Chilled Water				
GMQ Elec Conversion	kWhr/tonhr	1.055	1.055	
Electric Conversion	kWhr/tonhr	0.794	0.796	-0.27%
GMQ Water Conversion	gal/tonhr	5.25	5.25	
Water Conversion	gal/tonhr	1.66	1.70	-2.68%

*positive percent difference values imply an increase from FY09 to FY10

D. Operating Costs

The operating costs for the DES include the management fee to CEPS, debt service payments on the bonds and engineering and administration costs. Some of these costs are fixed, implying that they do not vary depending on the production or sales of steam or chilled water. The variable costs are dependent on the amounts of steam and chilled water produced and sold to the customers and include the utility and chemical treatment costs. The vast majority of the costs incurred for the operation of the DES are passed onto the customers in the form of the demand charges (fixed costs) and energy charges (variable costs). A summary of the total operating costs for the Second Quarter FY10 are shown in Table 3.

The revenues shown reflect the charges to the customers for their respective steam and chilled water service. The difference between the total costs and revenues from the customers is the shortfall that must be paid by Metro. The shortfall exists, in part, due to the remaining capacity at the EGF that was included in the original construction and remains unsold. This capacity is available for potential future customers.

The current fiscal year system operating costs were \$8,585,124 at the end of the Second Quarter. This value represents approximately 41% of the total budgeted operating cost for FY10. The customer revenues from the sales of steam and chilled water for the first half of FY10 were \$7,405,726 which is approximately 40% of the budgeted amount. The difference between the operating costs and customer revenue, the Metro funding amount (MFA), is \$1,179,726. This value is approximately 48% of budget. At the time of this report, the CEPS invoice for their management fee of \$355,917 had been issued but not paid by Metro. Therefore, the “Reimbursed Management Fee” shown in Table 3 does not reflect this payment. The addition of this payment to Table 3 does not change the MFA.

Table 3. FY10 Operating Expenses to End of Second Quarter

Item	FY 10 Budget	Total Expenses to Date	Percent of FY10 Budget
FOC: Basic	\$ 3,976,200	\$ 1,926,085	48.44%
FOC: 9th Chiller	\$ 37,200	\$ 18,048	48.51%
FOC: Change Order 6A	\$ 73,400	\$ 35,631	48.54%
FOC: Change Order 6B	\$ 64,300	\$ 31,194	48.51%
Chemicals	\$ 161,200	\$ 74,891	46.46%
Engineering	\$ 26,200	\$ 16,578	63.28%
Insurance	\$ 43,700	\$ 27,723	63.44%
Marketing: CEPS Sales Activity	\$ 9,800	\$ -	0.00%
Metro Marketing	\$ 35,000	\$ 8,564	24.47%
Incentive Payments	\$ -	\$ -	n.a.
Project Administration	\$ 24,000	\$ -	0.00%
Metro Incremental Cost	\$ 526,400	\$ 186,757	35.48%
FEA: Steam	\$ -	\$ 53,980	n.a.
FEA: Chilled Water	\$ -	\$ 194,436	n.a.
ARFA	\$ -	\$ 27,973	n.a.
Metro Credit	\$ -	\$ (221,345)	n.a.
Water/Sewer	\$ 689,600	\$ 194,705	28.23%
Natural Gas/Propane	\$ 4,692,900	\$ 1,297,038	27.64%
Electricity	\$ 5,034,100	\$ 2,083,012	41.38%
EDS Repair & Improvement	\$ 176,500	\$ 63,339	35.89%
EDS Surcharge	\$ 70,600	\$ -	0.00%
Sub-total Operations	\$ 15,641,100	\$ 6,018,610	38.48%
2002 Bonds	\$ 4,362,900	\$ 2,181,405	50.00%
2005 Bonds	\$ 627,600	\$ 168,794	26.90%
FY07 Projects	\$ 227,800	\$ 112,075	49.20%
FY08 Projects	\$ 220,500	\$ 112,075	50.83%
Debt Service Interest Revenue	\$ (123,700)	\$ (7,835)	6.33%
Oper. Reserve Funding Deposit	\$ -	\$ -	n.a.
Sub-total Debt Service	\$ 5,315,100	\$ 2,566,514	48.29%
Total Expenses	\$ 20,956,200	\$ 8,585,124	40.97%
Customer Revenues	\$ 18,512,100	\$ 7,405,726	40.00%
Total Metro Funding Amount	\$ 2,444,100	\$ 1,179,398	48.25%

The DES serves 26 customers and 40 buildings in downtown Nashville. These customers are divided into three categories: 1) Private customers who privately own their buildings, 2)

State of TN owned buildings and 3) Metro owned buildings. A summary of the annual costs for each of these three categories is presented in Table 4. These values include late fees and penalties and any unpaid balances.

The previous tenant in the building at 401 Union Street is no longer a customer due to an abandonment of the premises. This building is currently owned by Metro but remains unoccupied and does not utilize any steam or chilled water. The former tenant and Metro have outstanding balances to DES that have not been collected to date. The revenue budgeted for this customer for FY10 will not be collected, thus the fixed cost component anticipated from this customer will not be paid, resulting in a potential increase in the MFA.

Table 4. FY10 Customer Revenues

Building	Chilled Water			Steam		
	Total Cost	Consumption (tonhrs/yr)	Unit Cost (\$/tonhr)	Total Cost	Consumption (Mlb/yr)	Unit Cost (\$/Mlb)
Private Customers	\$ 1,800,768.26	9,472,964	\$ 0.1901	\$ 771,919.46	32,644	\$ 23.646
State Government	\$ 1,648,299.38	9,014,448	\$ 0.1829	\$ 1,044,708.13	43,574	\$ 23.976
Metro Government	\$ 1,496,493.51	9,072,346	\$ 0.1650	\$ 895,272.37	36,025	\$ 24.851
New Customers	\$ 599,456.26	3,229,761	\$ 0.1856	\$ 123,017.61	5,171	\$ 23.789
Total	\$ 4,945,561.15	27,559,758	\$ 0.1794	\$ 2,711,899.96	112,243	\$ 24.161

Total Revenue \$ 7,657,461.11
 True-up and Adjustments \$ (251,735.11)
 Net Revenue \$ 7,405,726.00

III. EGF Operations

Items relating to the facility operations presented herein are derived from the monthly reports issued by CEPS for FY10. Communication between TEG and CEPS continues to be excellent, and CEPS has reported and managed all EGF operations satisfactorily and according to the ARMA with no contract violations.

A. Reliability

The principle issues surrounding the reliable operation of the EGF relates to the ability to operate without significant interruption, exclusive of planned outages, and disruption of service to the customers. CEPS did not report any disruptions in service during the quarter.

B. Efficiency

The operation of the EGF satisfied the guaranteed levels for all commodity usage during the quarter. There were no significant excursions above the guaranteed levels for the Second Quarter. A more detailed discussion of the contract guarantee performance was presented previously in this report.

C. Environment, Health and Safety

No environmental violations were reported during the quarter. There were no employees reported to be on light duty and were no reported lost-time accidents during the quarter.

Monthly safety meetings were conducted by HazMat, Inc. and through CEPS personnel.

D. Personnel

The EGF currently has twenty-six full time employees with one employee also working as the CEPS project manager. Of the current number of employees, nineteen were previously employed by Nashville Thermal Transfer Corporation. There were no personnel changes during the quarter.

E. Training

Staff training for this quarter consisted of the Health and Safety training discussed previously.

F. Water Treatment

The water treatment program consists of regular testing and monitoring of the water chemistry in the steam, chilled water and condensing water systems. Chemicals are added to control the water hardness, chlorine levels and biologicals. Remote testing of the condensate at the AA Birch, Tennessee Tower and the Andrew Jackson also occurs regularly to monitor the concentration and distribution of the steam system chemicals.

- Steam System
 - The free chlorine level has stabilized during the quarter downstream of the sulfite injection.
 - The neutralizing amine auto-feed controller continues to be adjusted as the steam load changed.
 - Condensate return was restored on October 7 from being sent to drain much of September.
 - The hardness and iron content in the steam and condensate systems were generally excellent during the quarter with a few exceptions. Condensate was sent to drain from November 22 to November 25 due to hardness levels detected in the condensate from some State buildings.

- Condensing Water System
 - The conductivity of the condensing water continues to be normal with only a few excursions resulting in high cycles of concentration and low blowdown rates.
- Chilled Water System
 - The system control and chemistry continues to be excellent.

G. Maintenance and EGF Repairs

CEPS continues to report on the numerous routine maintenance and preventive maintenance activities performed on the EGF primary and ancillary equipment. The principle items are discussed herein as they relate to the repair, maintenance or replacement of equipment or devices at the facility and are not considered extraordinary. The cost for these items is included as part of the FOCs.

- Cooling towers #1, 2, 3, 4, 5, 6 and 9 were drained and cleaned for the winter season.
- The oxygen sensor for boiler #1 and #4 were re-calibrated.
- External boiler inspections were performed by the insurance inspector.
- Tube cleaning began with chiller #7 in December.
- The refrigerant temperature sensor on chiller 1B was replaced.
- The outboard bearing and seals on boiler feedwater pump #3 were replaced.
- The cooling fan on the motor for the condensate pump #5 was replaced.
- Other minor repairs and maintenance were made during the quarter and are listed in the monthly reports issued by CEPS.

H. EGF Walk-through

A quarterly Walk-through of the EGF was performed on January 5, 2010, by Kevin Jacobs, P.E. of TEG. This review involved a tour of the facility with the primary points of interest and concern noted herein.

- A construction sign was leaning against the wall near condensing water pump #2. This sign had not been observed previously, but should be removed to storage or thrown away.
- The operator log book indicated no recurring issues.
- The condenser head for chiller #7 had been removed, and the tubes were being cleaned.
- Most of the cooling tower cells had been drained of water and cleaned. The remaining towers were being operated and had ice suspended from the fill. The outside air temperature during the walkthrough was below 20°F.

- Numerous minor cracks in the outside concrete walls remain. No additional work has been performed on these cracks. No action is required at this time.
- Empty cardboard boxes are being stored in the electrical room. This item was noted in the previous quarter's walk-through. These boxes should be removed.
- The vacuum breaker on the DA is located along the catwalk between the DA heads. This device was leaking a very small amount of steam during the walkthrough. Should this device ever fail, steam will be discharged onto the catwalk. It would be beneficial for the outlet of this device to be piped away from the catwalk to reduce the exposure of steam in the direction of the catwalk.

IV. Capital Projects

The Capital Projects discussed in this section are those projects funded through the issuance of bonds by Metro. Costs for these projects will be paid from funds already appropriated. New projects are anticipated for the 2010 Bond Projects, but the majority of these projects remain in the planning stages of development.

The status of the projects are discussed, and the project cost-to-date and bond balances are also presented.

A. Second Quarter FY10 Open Projects

The following projects remained open at the end of the Second Quarter of FY10.

1. DES033 - Manhole Lid and Ring Replacement/Restoration

This project relates to the repair and replacement of manhole lids and rings whenever Metro Public Works performs street re-paving. No work was reported for this project during the Second Quarter FY10. This project will remain open.

2. DES048 - Tunnel Lighting & Electrical Upgrades Phase III

The first two phases of this project have been completed, and the final phase is budgeted and scheduled to be replaced during FY10. However, the repair to the tunnel structure needs to be completed prior to the lighting and electrical upgrades. Therefore, the completion of this project is on hold until DES067 is completed.

3. DES060 - Manhole & Tunnel Insulation Repair (Revised from DES050 for FY10)

Bids were taken early in the Second Quarter FY10 for three additional manholes to be re-insulated, Manholes 1, 2 and 3. This work was awarded and substantially

completed during the Second Quarter FY10. Closeout of the project work for these three manholes will take place during the Third Quarter FY10. The work associated with this project will be ongoing as required.

4. DES051 - Expansion Joint Replacement - 4th Ave Tunnel

Close-out of this project was completed during the Second Quarter FY10.

5. DES062 - Steam and Condensate Replacement to 120 2nd Avenue North

The condensate service line to 120 2nd Ave. North (Wildhorse Saloon) has been out of service for several months. There is a small manhole in 1st Avenue North that the steam and condensate services pass through that contains a dripleg. This vault is in poor condition and the replacement of the service piping to the Wildhorse offers the opportunity to eliminate this vault from service and thus avoid potential costly repairs. The design for the replacement of these service lines was completed during the First Quarter FY10. This project was bid and awarded during the Second Quarter FY10 and construction began during the same quarter.

Originally, completion of the work was scheduled for mid-December 2009. However, due to the discovery of unknown utilities, the pipe routing had to be redesigned. This resulted in delays in the fabrication and delivery of the pre-insulated piping system. Even after these delays, piping was successfully installed into the Wildhorse, and the Riverfront Park sidewalk was temporarily patched prior to the Christmas holidays. The tie-in of the steam and condensate service did not take place during the Second Quarter FY10 due to events at the Wildhorse and poor weather conditions. It is expected that the tie-in of these services and the completion of this project will take place during the Third Quarter of FY10.

6. DES063 - Manhole A, B & M Sump Pump Installation

Manholes A, B & M along First Avenue South experience significant amounts of groundwater infiltration and have to be pumped out frequently. During times of heavy rains, this water can accumulate quickly enough to submerge portions of the steam and trap piping resulting in boiling of this groundwater and heavy steaming of the vault. This project addresses the installation of sump pumps in these manholes to try and prevent the accumulation of groundwater. Design was completed and bids were received for this project during the Second Quarter FY10. However, the bids received were higher than anticipated, and an award was not made. Currently, TEG is evaluating methods to reduce the construction cost of this project to see if this project is viable.

7. DES066 - First Avenue Manhole Retirement

Manholes G, H and J along First Avenue North have not been in use for several years. These manholes are constructed of steel, and some of them are located in city streets. These manholes could potentially present a safety hazard if the structural integrity of these manholes were to decline to an unsafe condition. If this section of the distribution system were ever re-energized, the installation of new piping and manholes would be required.

These manholes were inspected during the Second Quarter FY10 and bids were received to fill them with flowable fill concrete. A preliminary award has been made. The Bidder and Constellation are processing the necessary paperwork, and it is anticipated that the implementation of this project will take place during the Third Quarter FY10.

8. DES067 - EDS Tunnel Structural (Rock) Rehabilitation

Design for the repairs to the tunnel rock walls was substantially completed during the Second Quarter FY10. This project will be bid and awarded during the Third Quarter FY10.

B. Second Quarter FY10 Closed Projects

The following projects were closed during the Second Quarter FY10:

DES051 - 4th Avenue Tunnel Condensate Slip Joint Replacement

C. Capital Projects Budget

The following table summarizes the costs and remaining balance of the DES capital projects based on reported expenditures at the end of the Second Quarter FY10. Open projects or completed projects that require some additional management are shown. Projects that were closed to date are shown with a gray highlight. Since the remaining funds from the 2002A bond have been consumed, the previous projects associated with this bond are no longer noted in the following table.

Table 5. Second Quarter FY10 Capital Project Budget Summary

DES Project #	Description	Total Budget	Total Spent to Date	Remaining Balance
2005B Bond Projects				
DES064	Spring 09 Steam Shutdown	\$ -	\$ 911.54	\$ (911.54)
DES063	Sump Pump MH B and M	\$ -	\$ 189.45	\$ (189.45)
Total Closed Projects		\$ 7,320,301.40	\$ 7,604,519.50	\$ (284,218.10)
Project Development		\$ 866,198.60	\$ 315,570.26	\$ 537,602.87
Total 2005B Bond		\$ 8,186,500.00	\$ 7,934,216.22	\$ 252,283.78
2007 Bond Projects				
Total Closed Projects		\$ 2,374,348.00	\$ 2,620,770.53	\$ (246,422.53)
Project Development		\$ 484,152.00	\$ -	\$ 484,152.00
Total 2007 Bond		\$ 2,858,500.00	\$ 2,620,770.53	\$ 237,729.47
2008 Bond Projects				
DES046	Ryman Auditorium Cond Line	\$ 150,000.00	\$ 242,242.11	\$ (92,242.11)
DES048	Tunnel Lighting & Elec Ph III	\$ 100,000.00	\$ -	\$ 100,000.00
DES051	Exp Jt Replacement 4th Ave At MH 17	\$ 220,000.00	\$ 5,596.04	\$ 214,403.96
DES056	Citizen's Plaza Steam and Condensate	\$ -	\$ 126,659.01	\$ (126,659.01)
DES057	Manhole 13	\$ -	\$ 35,023.92	\$ (35,023.92)
DES061	Tunnel Steel Corrosion	\$ 250,000.00	\$ 3,631.90	\$ 246,368.10
DES063	Sump Pump MH B and M	\$ 35,000.00	\$ 18,195.46	\$ 16,804.54
Total Closed Projects		\$ 1,798,500.00	\$ 2,447,151.56	\$ (648,651.56)
Metro Project Admin		\$ -	\$ -	\$ -
Project Man, Development, etc		\$ 187,393.20	\$ -	\$ 187,393.20
Total 2008 Bond		\$ 2,878,500.00	\$ 2,878,500.00	\$ 0.00
2010 Bond Projects				
DES059	CJC Steam & Cond Ser. Line Replace.	\$ 150,000.00	\$ 284.25	\$ 149,715.75
DES062	Stm and Cnd Line MHK to Wildhorse	\$ 300,000.00	\$ 16,376.90	\$ 283,623.10
DES067	Tunnel Rock Repair	\$ 1,152,000.00	\$ 304.97	\$ 1,151,695.03
DES068	St. Mary's Cond Tempering Station	\$ 20,000.00	\$ 1,374.94	\$ 18,625.06
DES069	Municipal Aud Tempering Station	\$ 25,000.00	\$ -	\$ 25,000.00
DES070	MH 6 to 23 Cond Line	\$ 300,000.00	\$ -	\$ 300,000.00
DES071	Hermitage Hotel Ser Modifications	\$ 125,000.00	\$ -	\$ 125,000.00
DES072	Sheraton Stm & Cond Line	\$ 250,000.00	\$ 30.10	\$ 249,969.90
Total Closed Projects		\$ -	\$ -	\$ -
Metro Project Admin		\$ -	\$ -	\$ -
Project Man, Development, etc		\$ 88,000.00	\$ -	\$ 88,000.00
Total 2010 Bond		\$ 2,410,000.00	\$ 18,371.16	\$ 2,391,628.84

V. Energy Distribution System Repairs, Improvements, PM and Emergencies

Several EDS repairs and improvements were made during the Second Quarter. The principle items for discussion are presented in the following sections.

A. Repairs and Improvements

Several repairs were made to the EDS and at customer buildings during the quarter. The items listed herein fall outside the scope of the DES Capital Projects. The remaining value

of the R&I budget at the end of the Second Quarter FY10 is \$518,768. Table 6 provides a summary of the FY10 expenditures and revenues to date associated with the R&I budget.

Table 6. Repair and Improvement FY10 Expenditure and Revenue Summary

Description	Date	Tracking #	Vendor	Expenditure	Transfers	Net Market Adjustment	Market Value	Balance
"Market Value" and "Cost Value" at end of FY09						\$ (580.00)	\$ 458,943.32	\$ 458,935.96
DES Repair And Improvements, for billing period of 6/28/09 - 8/1/09	08/11/09	DES-1043	TEG	\$ 455.30				
Constellation Energy - Period 6/1/09 - 6/30/09 (EDS Repair)	09/04/09	DES-1044	CEPS	\$ 837.67				
DES Repair And Improvements, for billing period of 8/2/09 - 8/29/09	09/16/09	DES-1056	TEG	\$ 56.85				
Constellation Energy - Period 7/1/09 - 7/31/09 (EDS Repair)	09/09/09	DES-1057	CEPS	\$ 619.73				
Constellation Energy - DES-066 Progress Billing	09/29/09	DES-1069	CEPS	\$ 24,724.22				
DES Repair And Improvements, for billing period of 8/30/09 - 10/3/09	09/28/09	DES-1068	TEG	\$ 5,661.15				
Constellation Energy - Period 7/1/09 - 7/31/09 (EDS Repair)	09/28/09	DES-1082	CEPS	\$ 3,293.57				
Sub-Total First Quarter FY10				\$ 35,648.49	\$ 61,775.01	\$ (7.36)	\$ 26,119.16	\$ 26,126.52
Constellation Energy - Period 9/1/09 - 9/30/09 (EDS Repair)	11/20/09	DES-1085	CEPS	\$ 6,149.92				
DES Repair And Improvements, for billing period of 10/4/09 - 10/31/09	11/05/09	DES-1081	TEG	\$ 2,756.46				
DES Repair And Improvements, for billing period of 11/1/09 - 11/28/09	12/04/09	DES-1096	TEG	\$ 36.30				
Constellation Energy - Period 10/1/09 - 10/31/09 (EDS Repair)	12/03/09	DES-1098	CEPS	\$ 3,051.32				
DES Repair And Improvements, for billing period of 10/4/09 - 10/31/09	01/08/10	DES-1112	TEG	\$ (1,019.45)				
Constellation Energy - Period 11/1/09 - 11/30/09 (EDS Repair)	01/06/10	DES-1114	CEPS	\$ 3,673.14				
Constellation Energy - DES-066 Progress Billing	01/06/10	DES-1113	CEPS	\$ 12,537.86				
DES Repair And Improvements, for billing period of 11/29/09 - 1/2/10	01/12/10	DES-1111	TEG	\$ 884.10				
Sub-Total Second Quarter FY10				\$ 28,069.65	\$ 61,775.01	\$ -	\$ 33,705.36	\$ 33,705.36
Sub-Total Third Quarter FY10				\$ -	\$ -	\$ -	\$ -	\$ -
Sub-Total Fourth Quarter FY10				\$ -	\$ -	\$ -	\$ -	\$ -
FY 10 Year to Date				\$ 63,718.14	\$ 123,550.02	\$ (7.36)	\$ 518,767.84	\$ 518,767.84

B. Preventive Maintenance

Preventive maintenance, tunnel and manhole inspections and reviews of customers' mechanical rooms were performed during the quarter. The principle items for discussion are presented.

1. EDS Tunnel and Manhole Inspections
 - a. Rock continues to be in need of repair in the ceilings in the tunnels under Broadway and 7th Avenues.
 - b. Several leaks were found and repaired during the quarter.
 - c. Minor repairs were made during the quarter.

2. State Tunnel Inspections
 - a. Several leaks were found and repaired during the quarter.
 - b. Other minor repairs were made during the quarter.
3. Manhole and Other EDS Inspections
 - a. The chilled water leak in MH M was monitored regularly during the quarter, and the vault was pumped as required.
 - b. The steam isolation valve at the James K Polk Building was repaired.
 - c. The thermographic surveys conducted during the quarter indicated that the heat around the service in front of St Mary's is becoming more noticeable. There were no new hot spots found during the quarter.
 - d. Several steam traps were replaced.
 - e. The Broadway tunnel was winterized.
 - f. Other minor items are included in the CEPS monthly reports.

C. Emergencies

CEPS did not report any emergencies with the EDS during the quarter.

D. EDS Walk-through

The EDS walkthrough was conducted on January 19, 25 and 26, 2010. The manholes visited included Manholes 10, 11, 12, 16A, 22A, C, S4A, U, Viridian, B2, B3 and B4. The following comments and observations are a result of these visits:

1. Manhole 10
 - a. The steel structural components in the vault need to be cleaned of all rust and painted to prevent further corrosion. This vault should be a "Low" to "Moderate" priority on the "MH & Tunnel Structural Corrosion Prevention/Repair" project list.
 - b. As reported in the last EDS Walkthrough Report, the asphalt pavement above the manhole has buckled and formed "humps" along the axis of traffic. Additionally, it was reported that some of the interior concrete beams have experienced cracking and spalling. Since the last report, TEG reviewed pictures from the prior EDS Walkthrough of Manhole 10 from September 2008. A comparison of the current photos with the September 2008 photos revealed a marked advancement of the concrete/beam deterioration. Therefore, TEG consulted with a structural engineer and upon review of the photos, the structural engineer determined that the concrete beam has failed. In the opinion of the structural engineer, the current condition of the concrete beam does not present a hazard to the general public. In

order to determine the extent of this failure, an exploratory dig will be conducted. A design to repair this manhole structure will be completed upon completion of the exploratory dig. The necessary repairs will be made after the design is completed.

2. Manhole 11

- a. Portions of the interior piping in this manhole was recently replaced under DES capital project 056.
- b. The small manhole lid and frame are recessed below the street surface. In order to help prevent the inflow of surface water, this lid and frame need to be raised.

3. Manhole 12

- a. There is some cracking of the concrete manhole roof, especially in and around the manway accesses. This cracking should be monitored to determine how quickly it is progressing in order to determine if immediate repair is required.
- b. There is virtually no piping insulation present in this manhole. This manhole is listed as a “high” priority on the Manhole Insulation priority list developed by CEPS.
- c. The steel structural components in this manhole need to be cleaned of all rust and painted to prevent further corrosion. This vault should be a “Moderate” to “High” priority on the “MH & Tunnel Structural Corrosion Prevention/Repair” project list.
- d. There is some debris inside this manhole along with a large amount of rock and dirt on the floor. The dirt can retain moisture and can help accelerate the corrosion of the metal structural components. All debris, dirt and rock should be cleaned from this manhole.

4. Manhole 16A

- a. There is some minor corrosion on the chilled water piping support “tabs”. This corrosion should be removed from these support tabs, and the tabs painted and insulated to prevent further corrosion.
- b. The grated platform does not extend around the chilled water piping penetrations and presents a potential safety hazard. CEPS should add a railing and toeboard around this opening; or if the railing presents a problem, TEG can design additional grating to be added.
- c. There is a significant amount of gravel at the base of the entrance ladder. This gravel appears to have been disposed of in this manhole from a construction project. This gravel should be removed.

5. Manhole 22B
 - a. There is no grating around the vertical piping “penetrations” within this manhole which presents a safety hazard. Grating with toeboards and possibly handrails should be added to this vault. TEG will develop a design for the addition of the grating. Access to this manhole should be restricted until this grating/handrails are installed.
 - b. There is some seepage of water around the linkseal on the steam piping leaving this manhole. This linkseal should be tightened to prevent water infiltration.

6. Manhole C
 - a. There is some minor groundwater seepage around the steam piping wall penetration linkseals. The linkseal bolts should be tightened to stop this seepage.

7. Manhole S4A
 - a. This manhole was recently discovered and was part of the State steam system. A steam leak developed in this manhole a couple of weeks prior to this report, and it was discovered that it should be included in the monthly manhole inspections. The steam leak was a result of a hole in a steam trap. Currently the trap is isolated awaiting replacement.
 - b. There are a lot of leaves on the floor of this manhole that need to be removed so a more thorough review of the vault’s condition can be conducted.
 - c. There are several problems in this manhole which need to be addressed:
 - (1) The manhole only has a single manway which presents a potential safety hazard.
 - (2) There are several State communication cables in this manhole which are not properly supported and are “laying” across the steam and condensate piping. These cables need to be protected and properly supported.
 - (3) The condensate piping is not insulated and the steam piping insulation is in disrepair.
 - (4) The concrete ceiling of the manhole is in very poor condition; the lower matt of rebar is exposed, and they are very badly corroded.
 - (5) The concrete walls have several cracks in them.
 - (6) The upper ladder rung is non-existent. One of the side rails has been bent to form an upper rung to ease ingress and egress.

TEG will contact the State to discuss who is responsible for this manhole and develop recommendations for remedies to these problems.

8. Manhole U

- a. A large portion of the western manway frame lip which supports the manway lid is nonexistent. This presents a potential safety hazard for vehicles and pedestrians. This manway frame and lid should be replaced as soon as possible. (This situation was conveyed to CEPS, and the frame and lid was replaced within hours of it being reported to CEPS.)
- b. The wall mounted brackets which held the old access ladder in place are still attached to the western wall. These brackets present a potential safety hazard to maintenance personnel and should be removed.

9. Viridian Manhole

- a. Due to piping obstructions, the entry ladder in this manhole is “offset” from the top of the ladder to the bottom. TEG will evaluate this arrangement to determine if a better and safer arrangement can be developed and installed.

10. Manhole B2

- a. The insulation blanket has been removed from the main steam valve and is laying in the floor. This blanket needs to be inspected and re-installed on the steam valve if it is not damaged.
- b. Some of the insulation and lagging has been damaged due to water infiltration. In addition, it appears that a repair was made to the trap piping connected to the dripleg. The insulation around this dripleg was cut back and removed to gain access to the trap piping and the insulation has not been repaired. There is also some insulation missing from some valves and a small section of jacket that is missing. This insulation and jacketing should be repaired.
- c. There is water seepage at the western steam piping linkseal. This linkseal should be tightened to help reduce the infiltration of groundwater.

11. Manhole B3

- a. There were several loose anchor bolt nuts on the beams in this manhole. These were tightened. These nuts should be checked and monitored during each manhole inspection.
- b. There is some damaged insulation and jacketing which needs to be repaired.

- c. The steel structural components in this manhole need to be cleaned of all rust and painted to prevent further corrosion. This vault should be a “Low” priority on the “MH & Tunnel Structural Corrosion Prevention/Repair” project list.
12. Manhole B4
 - a. There is some damaged insulation and jacketing which needs to be repaired. It is not clear as to how this damage occurred.
 - b. There is insulation which is missing from the condensate piping at the northern slip joint. This insulation should be replaced.

VI. Customer Relations

This section contains descriptions of the marketing efforts made by the DES Team during the quarter. The topics of interactions, meetings and training seminars with the customers are also discussed. There are currently 27 customers, comprised of 40 different buildings, connected to the EDS. Service to each of these buildings continues to prove satisfactory, and the responsiveness to customer issues is handled by CEPS in an excellent and professional manner.

A. Marketing

TEG and Metro DES continue to monitor and remain involved with the progress associated with the development of the New Convention Center and Hotel.

B. Customer Interaction

- Several customers reported issues with either their in-building heating or cooling systems. These issues were addressed by the CEPS customer service representative (CSR). In most cases, the issues related to failed customer equipment or the improper control of the building system.
- Steam service was restored for several buildings that isolate their in-building steam system during the summer months.
- Metro General Services intends on installing a new domestic water heater in the Municipal Auditorium to replace an existing heater that has failed. They were in contact with CEPS and TEG during the quarter regarding this issue.
- Adjustments were made to either the temperature control valves or the chilled water setpoint temperatures at the Metro Library, Fifth Third Bank and the Renaissance Hotel.
- The steam isolation valve at the State Library and Archives was replaced during December.
- Other minor issues and customer interactions are noted in the monthly CEPS reports.

VII. Recommendations

Based on the review of the Second Quarter EGF and EDS operations, the following recommendations are made.

- The installation of a condensate polisher will permit the return of condensate from the distribution with high levels of iron or hardness. The current practice by CEPS is to dump the condensate to drain in the Broadway Avenue tunnel at MH-18 whenever the condensate impurities test high. Although this practice protects the boilers at the EGF, the operations incur increased costs in water, chemicals and fuel whenever the condensate is not returned. The cost of the polisher and its economic benefit to the customers will be investigated during the Third Quarter FY10. If the economic benefit is justified, the installation of the condensate polisher will be recommended.
- Safety items noted in the EDS Walk-through should to be addressed.
- Cleaning, painting, replacement and repair of structural steel within manholes to reduce or eliminate corrosion has been assigned a capital project number of DES061. Repairs will begin this fiscal year and will be ongoing in a similar method to the Insulation Repair Project (DES060).
- Insulation which is not present or in disrepair within the manholes should be addressed through either additional capital projects, which include work within these manholes, or through DES060.
- Minor leaks at pipe penetration linkseals should be addressed.
- CEPS should continue to remove any debris present in the manholes as inspections and schedules allow.